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AUTOMATION IN EDUCATIONAL ADMINISTRATION, 1--VENDING MACHINES IN SCHOOLS AND COLLEGES.

BY- FINN, JAMES D. AND OTHERS
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HISTORICAL AND MODERN APPLICATIONS OF AUTOMATIC MERCHANDISING (VENDING) WERE SURVEYED WITH PARTICULAR ATTENTION GIVEN TO THE USE OF VENDING EQUIPMENT IN EDUCATIONAL FACILITIES. THE ADVANTAGES WHICH VENDING EQUIPMENT OFFERS TO THE SCHOOL ADMINISTRATOR WERE DISCUSSED IN TERMS OF HANDLING BOTH FOOD AND NONFOOD ITEMS. IN ADDITION, FUTURE APPLICATIONS OF VENDING TO THE GENERAL EDUCATIONAL COMMUNITY WERE BRIEFLY DISCUSSED, INCLUDING POSSIBILITIES FOR SUCH ITEMS AS AUTOMATIC SNACK BARS AND AUTOMATED LIBRARIES. (JH)

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Occasional Paper No. 5

AUTOMATION IN EDUCATIONAL ADMINISTRATION, I: VENDING MACHINES IN SCHOOLS AND COLLEGES

by

Forrest M. Townsend
Director, School Services Department
The Vendo Company

A Report Prepared for the

TECHNOLOGICAL DEVELOPMENT PROJECT

of the

NATIONAL EDUCATION ASSOCIATION OF THE UNITED STATES

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The headquarters of the Project are located in the

School of Education
University of Southern California
Los Angeles, California
Mailing address: 924 West 37th Street
Los Angeles 7, California

The Washington office of the Project is located in the

National Education Association
1201 16th Street, N.W.
Washington 6, D.C.

Principal Investigator: James D. Finn (Los Angeles)
Associate Investigator: Lee E. Campion (Washington)

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FOREWORD

The Washington columnist, Bill Henry, recently had an item in his column in the Los Angeles Times concerning the plight of the U.S. Mint. It seems that the Mint, working overtime, cannot keep up with the demand for coins. This was not, Henry pointed out, so much due to antiquated methods of production as to an unprecedented demand for pennies, nickels, dimes, etc. The demand is a direct function of a developing technology -- the technology of vending machines. Vending machines are having an impact on the way Americans obtain services and supplies of all kinds.

While the Technological Development Project is primarily concerned with the direct technology of instruction, it has not been unmindful of the technological changes occurring in other fields of education, such as educational administration. Such changes affect instruction in many ways. When costs for services outside of direct instruction, for example, are reduced, more money becomes available for teachers and the materials and instruments of instruction.

The area of vending machines is one such area and, as this paper shows, it is a rapidly growing field of operation within education. Further, vending equipment is related directly to instruction in its possibilities for handling supplies and even in automating certain areas of library service.

Since there has been absolutely no literature on this subject available to educators, the Project asked Forrest M. Townsend of the Vendo Company of Kansas City, Missouri to prepare a paper. Mr. Townsend has specialized in the applications of vending equipment to educational problems and is very knowledgeable in this field. The Technological Development Project is pleased to add Mr. Townsend's paper to our growing list of Occasional Papers.

James D. Finn
Los Angeles, March, 1962

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SECTION I

HISTORY OF THE VENDING MACHINE[1]

The idea of selling things from machines is nearly as old as recorded history. About 215 B.C. a Greek inventor and mathematician, Hero Cstebus, described and illustrated a coin-activated device for vending sacrificial water in Egyptian temples!

No further reference is found in historical literature concerning the use of coin-operated vending devices until the Seventeenth Century. About 1615 snuff and tobacco boxes, actuated by the insertion of coins in the lids, appeared in English taverns and inns. These were called "honor boxes", for the customer was honor bound to close the box after taking a pipeful of tobacco. Some of these early vending machines were brought to the Colonies, and a few survive in museums and private collections.

In 1885 the penny weighing scale was introduced in the United States as an import from Germany. In 1888, Thomas Adams, founder of the Adams Gum Company, installed machines on New York City's elevated platforms to sell his Tutti-Fruitti gum.

The December 26, 1891, issue of Scientific American, reporting on the rise of the "Automatic Fountain" in Paris and other French cities, stated "In the automatic distributors of which we speak, it suffices to put a coin, say a five cent piece, in a slot, when a tube placed beneath the money box allows a small glass of malaga, a large glass of beer, etc., to flow. The apparatus operates with perfect regularity, and the quantity of liquid is always accurately measured, its volume varying with its nature. There are distributors of this kind that serve hot liquids (such as coffee) or iced ones. A series of different types is at present installed at the Exposition of Labor at the Palace of Industry. Our Parisian readers will be able there to observe the regularity with which these automatic apparatus operate. Several bars provided with them are installed in different parts of Paris."

The last decade of the Nineteenth Century witnessed a rash of new vending inventions and innovations. A wide range of products and services was vended, including postage stamps, perfumes, bon-bons and chocolate, books, peanuts and even divorce papers (entirely legal, they were for a while available from a vending machine in Corrinne, Utah).

U.S. vending took a dramatic step forward when, in June, 1902, Horn and Hardart Baking Company opened its first Automat at 818 Chestnut Street in Philadelphia. The opening of the Automat created a sensation. The next year Horn and Hardart successfully invaded New York City.

The years between 1902 and World War I witnessed an increasing variety of merchandise being sold in machines: Wrigley's penny gum, Life Savers, lighter fluid from a counter-top vending machine designed to look like a gasoline pump, paper towels, sanitary napkins, cigars. In 1925 the first cigarette vending machines were introduced. Packaged ice venders made their first appearance in Los Angeles in 1931. Late in the 1930's the first practical vender for bottled soft drinks was manufactured. When the War Production Board suspended manufacture of vending machines early in 1942, a variety of venders were being produced, but the "big four" sold candy, gum, soft drinks and cigarettes.

The practical impact of the vending machine on our economy was not generally recognized prior to the middle and late 1940's. Prior to this time much of the public image of vending placed vending machines in the same category as coin-operated gambling devices. Technical developments came with a rush following World War II. Improved coin mechanisms, automatic coin changers, mechanical, refrigeration and insulation improvements, design and appearance --- with an economy geared to the demand for more and more services in more and more places --- combined to produce a dramatic rapid growth in the vending industry seldom equalled in our economic history.

By 1961, the dollar volume of vended products reached an annual figure of $2,586,000,000. Nine items or classes of products accounted for about 85% of this volume.

Item	1960 Dollar Volume	Machines in Operation
Cigarettes	$1,141,920,000.	793,000
Soft Drinks	438,619,000.	947,300
Candy	304,647,000.	585,400
Coffee	142,940,000.	149,800
Milk	61,630,000.	52,500
Bulk Confections	54,880,000.	1,120,000 (penny and nickel items)
Ice Cream	25,550,000.	36,500
Hot Canned Food	22,121,000.	22,900
Cigars	8,785,000.	50,200

[1] G.R. Schrieber, "A Concise History of Vending in the U.S.A.," Vend Magazine, 1961, p. 10.

For many years, the automatic vender was "built around the package". In other words, designers of vending equipment first looked to product manufacturers and then built equipment which would sell what was available. This was true of bottled soft drinks, gum, cigarettes and candy. Milk in half pint cartons called for increased volume in this type of packaging, although it had previously been available in limited supply. Ice cream novelties also represented slight modifications of existing packaging facilities in some cases.

In the past few years, vending has emerged from the refreshment field into food service, as equipment was developed to serve freshly prepared hot and chilled foods. This has meant that for the first time special packaging had to be devised, and also that the entire concept of sanitation for venders had to be reviewed. Special plastic, foil and paper containers have been developed for food service --- in a rainbow of colors --- and experimentation has been made on overwraps of various kinds, with a view toward providing most effective closures.

A significant development in vending has been the Code for Vending Machines developed by the U.S. Public Health Department in cooperation with representatives of the industry. State and local health agencies have full control within their areas. The Sanitation Ordinance and Code, with the full endorsement of the vending industry's National Automatic Merchandising Association was approved and issued by the U.S. Public Health Service in 1957. (USPHS Publication #546.)

Today vending equipment has been perfected to the point where it can serve virtually any kind of food. Thermal controls hold food at the peak of serving perfection, whether it is piping hot or chilled. Individual packaging retains flavor and reduced exposure to possible contamination through the air. The last link in automatic service has been forged with the development of currency changers which exchange coins for paper bills.

Savings in time and money, efficiencies of service for large groups of people, round-the-clock service, a reduction in the amount of floor space needed for food facilities, flexibility of operation and availability of product where desired are some of the advantages offered by modern vending equipment.

Whether it is used in a cafeteria to "pull" a certain product out of the line, or as a completely independent food service facility, vending equipment has many benefits for the school administrator.

The challenge which vending today offers the school business or administrative official is how to best adapt the automatic equipment to serve his particular needs.

SECTION II

HISTORY OF VENDING MACHINE USE IN EDUCATIONAL FACILITIES

Elementary and Secondary Schools

Vending equipment was in limited use in elementary and secondary schools prior to World War II. Most popular models were candy and soft drink machines. They were generally located in hallways, gymnasiums, assembly and auditorium areas. They were obviously popular with the students, and also provided revenues normally used to help support non-budgeted school or student activities.

Following the Korean War, considerable expansion in school vending of fruit juices, cookies, milk and ice cream took place as technological improvements in equipment made the vending of these items practical and acceptable to school administrators.

It was not until 1957, however, that the extent of vending in elementary and secondary schools was considered worthy of being surveyed. The United States Bureau of the Census conducted a "Survey of the Market for Food in Public Schools" in 1957.[2] At the time of this survey there were about 106,000 public and 16,000 private and parochial elementary and secondary schools in the U.S.

Approximately 60,000 and 2,400, respectively, offered some food service in 1957. Private schools were not included in the study due to sampling difficulties involved.

In that part of the survey dealing with the incidence of vending machines, the Bureau of the Census reported "of the approximately 60,000 public schools with a feeding service, about 18% used some kind of food-dispensing (vending) machine between July 1957 and June 1958. In terms of numbers the most popular were those vending soft drinks, followed by those providing milk, candy, crackers and other similar food items. As for school and community characteristics, vending machines in general were most prevalent in schools having an enrollment of 300 or more pupils, in schools serving an area where family incomes averaged under $4,000., and a community population density of under 2,500 people".

The Bureau of the Census survey did not cover the 46,000 public schools without feeding services or the 16,000 private and parochial elementary and secondary schools.

It seems safe to assume that the incidence of vending in these 62,000 schools was at least as great as in the portion of the school market included in the survey.

Soft drinks, milk, candy and ice cream continued to represent practically all food and refreshment items vended in schools as late as 1961. The availability of milk through vending machines in schools had a dramatic growth in the years from 1957 to 1961. In these four years the incidence of milk venders in schools was greater than all milk vending machines manufactured prior to 1955.

In spite of the rapid growth of refreshment item vending in this part of the educational field, there is no evidence that vending other items has enjoyed any great acceptance. Vending machines designed to sell personal and school supplies such as pens, pencils, typing and note book paper, etc., have been available for a number of years, but their use is limited. News reports in late 1961, however, indicated a more general school administrator interest in the potential benefits of vending these items.

Colleges and Universities

Very little information is available regarding the extent of vending machine use in colleges and universities prior to World War II. By the late 1940's there were some vending machines on campus at most colleges and universities. Their use was expanding rapidly as post-war enrollments skyrocketed far beyond the capacity of the existing physical facilities.

It was not until 1957, however, that the first specific information on the extent of vending on campus was developed. In that year the publishers of "College and University Business"[3] magazine conducted an extensive survey on the use of vending machines in the college field.

The 639 colleges responding in the survey reported 6,100 vending machines on campus in 1954; 9,500 on campus in 1957. Projecting the survey returns, an estimated total of 31,350 vending machines were on campus in 1957 -- with well over two-thirds of the total vending units representing food or refreshment items. The following table reflects products vended, by number of machines, in the 639 institutions responding to the survey:

Product	No. of Machines
Soft drinks	2,858
Sanitary napkins	1,910
Candy, gum, nuts	1,566
Cigarettes	936
Milk	586
Cookies, crackers	545
Fruits, juices	270
Ice cream	241
Hot beverages	210
Postage stamps	176
Sandwiches	138
Hot foods, soups	42

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[2] The Market for Food in Public Schools, U.S. Dept. of Agriculture Report, No. 377, AMS - MR.
[3] College and University Business Magazine, Feb. 1959.

REPRODUCED FROM

"THE MARKET FOR FOOD IN PUBLIC SCHOOLS"

U.S. Department of Agriculture
Agricultural Marketing Service
Marketing Research Division
Marketing Research Report #377

TABLE 21.-- Number and percentage of public schools with food service having vending machines, by selected characteristics, July, 1957 - June, 1958.*

Item	Schools with Vending Machines		Schools without Vending Machines		All schools with Food Service	
	Number	Percent	Number	Percent	Number	Percent
All schools	10,748	17.8	49,679	82.2	60,427	100
Grades taught:						
Elementary	8,598	16.6	43,230	83.4	51,828	100
Secondary	2,150	25.0	6,449	75.0	8,598	100
Size of school:						
Large	6,329	21.6	22,929	78.4	29,258	100
Small	4,419	14 2	26,750	85.8	31,169	100
Family income level:						
Upper	2,388	11.4	18,510	88.6	20,899	100
Lower	8,359	21.1	31,169	78.9	39,528	100
Lunch program:						
National School Lunch Program	10,031	18.5	44,066	81.5	54,097	100
Other	717	11.3	5,613	88.7	6,329	100
Milk service:						
Special Milk Program	8,718	17.8	40,364	82.2	49,082	100
Other	2,030	17.9	9,315	82.1	11,345	100
Urbanization:						
Urban	3,941	13.9	24,362	86.1	28,303	100
Rural	6,807	21.2	25,317	78.8	32,124	100

*The data are subject to sampling variance. Because of rounding, detail may not add to total.

Other pertinent data on vending machines was reported as follows:

Increase in Installations from 1954 to 1957

Size and Control	1954 No. Machines	1957 No. Machines	Per Cent Increase	1954 Sales	1957 Sales	Per Cent Increase	1957 Net Income
Small Pub.	574	962	40	$ 56,090	$275,796	390	$ 45,463
Small Priv.	649	893	27	30,620	439,828	1,336	238,317
Med. Pub.	1,206	1,929	38	233,364	351,759	50	109,175
Med. Priv.	979	1,800	46	195,678	284,089	45	87,713
Large Pub.	1,489	2,412	38	197,415	337,415	93	104,204
Large Priv.	1,207	1,454	18	176,661	247,259	40	88,068

Vending Machine Installations by Size of School, Type of Control and Product Vended

Product Vended	Small Public	Medium Public	Large Public	Small Private	Medium Private	Large Private	TOTAL
Soft drinks	325	552	926	228	496	299	2,826
Sanitary napkins	184	389	394	229	379	335	1,910
Candy, gum, nuts	150	269	391	127	323	306	1,566
Cigarettes	87	221	131	90	153	203	885
Milk	42	143	143	46	119	93	586
Cookies, crackers	63	130	158	73	91	30	545
Fruits, juices	20	50	87	19	53	41	270
Ice cream	36	47	60	18	48	36	245
Hot beverages	14	26	46	7	46	71	210
Postage stamps	25	42	28	21	46	14	176
Sandwiches	5	40	30	12	35	16	138
Hot foods, soups	4	9	6	10	6	7	42

Relation of Student Enrollment and Type of Control to Use of Vending Machines

No. of Schools	Size School	Type of Control	Total Enrollment	Average Enrollment	No. of Machines	Average No. Machines
75	Small	Public	38,990	520	962	13
279	Small	Private	141,398	506	893	3
89	Medium	Public	169,006	1,900	1,929	22
87	Medium	Private	166,933	1,918	1,800	21
68	Large	Public	387,784	5,700	2,412	35
41	Large	Private	266,818	6,508	1,954	48

In spite of the apparently impressive extent of on-campus vending revealed by this survey, the potential of vending was not generally recognized by college administrators. Venders were placed on campus only as a demand arose for certain products, and machines were relegated to the basement, furnace room, "under the stairs", and other areas least conducive to acceptance or good service.

In the late 1950's, as college enrollment began its steep climb to unprecedented highs, the value of automatic, self-service equipment began to be recognized. As crash building programs developed, as the academic day was "stretched" to accommodate more classes, and as hordes of young people taxed every facility, it was discovered that campus food service could be extended through the use of automatic venders.

Modern equipment was now attractively designed to complement new trends in decoration and architecture, with modular styling which gave a "custom" look to batteries of venders. The equipment came out from out-of-the-way corners and was placed in convenient areas where it could be seen and used to maximum advantage. Classroom buildings, student unions, residence halls and all types of college gathering places installed banks of the coin operated venders. College administrators took time to evaluate the vending program on their campuses, and came up with policies and controls geared to their particular operations.

The economic trend of the times had made vending a valuable tool in the fight to provide good nutrition for greater numbers of students.

SECTION III

FUTURE VENDING MACHINE USE IN EDUCATIONAL FACILITIES

Elementary and Secondary Schools

Food and Refreshment

The impact and acceptance of vending machine use in elementary and secondary schools prior to 1961 indicates that future use will depend largely on trends and developments in the school lunch program. It is therefore necessary that a brief analysis of the past, present and future of school food service be accepted as the base for projecting the future of vending machines in this part of the educational field.

School food service - noon lunches - has a history beginning late in the Nineteenth Century. For all practical purposes, however, the serving of food at school - the present school lunch program - came into national focus as a segment of the total educational program after World War II.

The high rate of draftee rejections during World War II -- for disabilities directly traceable to poor or deficient dietary habits -- concerned both the military and civilian authorities. In June 1946, the U.S. Congress passed the National School Lunch Act. This act "to safeguard the health and well being of the nation's children" provided a permanent basis for developing a school feeding program -- a program which would be given federal assistance to help schools serve nutritionally well-balanced, low-cost noon day lunches.

By 1960 nearly 60,000 public, private and parochial elementary and secondary schools had established such programs. Nearly one-third of the total school enrolment was actually participating.

These school lunch programs developed primarily on the concept of each school unit having a complete food storage, preparation and serving facility. This undoubtedly had many advantages in the early developmental stages of the program from 1946 to the mid 1950's. It gave emphasis to the objective of making the school lunch an integral part of the total educational program. It provided a badly needed training ground for school food service personnel to permit continued expansion. It permitted maximum personal supervision, analysis of results, the development of uniform programming, administrative organization and growth.

These apparent early advantages, paradoxically, produced some major problems for the program by the late 1950's. Building, equipment and operating costs had risen steadily and this trend gave every indication of continuing through the 1960's. Many fiscally sound school lunch programs moved into a position of financial jeopardy during 1960-61. Adequate experienced or trained personnel are in short supply. The food service and school administrator faced with these problems must reappraise current operations. Worth of the program to the health of the nation's children has been proved. The educator has accepted the fact that it is more difficult to teach a hungry child.

There can no longer be a question but that school food services are here to stay. The socio-economic forces of life in the Mid-Twentieth Century make the hot, well-planned lunch not only a practical replacement for the lunch bucket, but, in an increasing number of cases, a necessary replacement.[4]

The future of the school lunch program and that of vending machine use is joined. Fortunately, vending can benefit those operational areas which are the greatest hazard to the stability and continued growth of the school lunch program.

Vending machines, installed in the school food service area to store and serve lunches prepared at a central school commissary-kitchen or in already existing school kitchens, present a number of advantages commending them to the attention of school administrators. The extent of application of these techniques to initiate or improve school food service programs is limited only by the imagination of the administrator.

Some of vending's specific benefits:

1. Eliminates the cost of building space for food storage and preparation areas in every school, and substantially reduces the food service requirements. In existing facilities this means converting present kitchen and storage space for other school uses at minimal cost.
2. Eliminates kitchen and serving line equipment costs.
3. Permits better utilization of qualified personnel in centralized operations.
4. Permits uniform food quality and portion control, reducing costs and assuring better management control.
5. Reduces sanitation problems at the school through less waste and fewer garbage disposal problems.
6. Increases speed of service, permitting students to spend more time actually eating.
7. Allows increased emphasis on nutrition education.
8. Without additional equipment, vending permits service of breakfast or evening meals or snacks where desired.

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[4]Dr. John N. Perryman, The Nation's Schools, Vol. 69, No. 1 (Jan. 1962)

The school administrator cannot ignore the urgent need to eliminate or drastically reduce deficits in his total educational program. The tax community demands it, and answers already available must be analysed and applied wherever practical.

The "good old way" isn't good enough today when every logical means must be employed to do the total job with the dollars available. The time -- for the utilization of vending machines in the school lunch program to keep it healthy and sound as it should be -- is now.

Non-Food Items

The application of vending techniques to the handling of non-food items is limited only by the need and the imagination of the individual school administrator. The need is present for applying these techniques, and during the decade of the 1960's the growth of non-food item vending will rival the dramatic growth of the vending industry during the 1950's.

Closed school grounds require that more and more services be provided to students and school personnel within the school plant. The marked trend to closed grounds had extended by 1960 to elementary as well as secondary schools in some areas.

Almost since time immemorial the basic student needs for learning the three "R's" has been pencil and paper. This has progressed through the years to the need also for notebook and typewriting paper, ballpoint pens, notebooks and a wide variety of other materials at the school. These have been supplied traditionally either by local merchants in their places of business near the school, or by "under the stairs" stands operated by student help. In some cases the pencil "dispenser" has been a drawer of each teacher's desk where little Johnny or Mary could, in desperate circumstances, get a pencil or a badly needed piece of paper.

By early 1960 the vending of these items through coin-operated machines had reached substantial proportions, particularly in the secondary school level. During the 1960's it will become practically universal. The need for manually handling many small items of student supply is becoming a very pressing problem. Details of purchasing, storing, selling and inventorying these items creates the need for applying vending techniques in this area.

It is becoming increasingly apparent that school administrators are having to assume responsibility for many activities which may not seem directly related to the overall educational program. In this category would be the availability to students in the school plant of such items as athletic T-shirts, shoes, socks and all the other items of a personal nature which may be required for gymnasium and physical education programs. It is predictable that such items will generally be made available through vending by the mid-1960's.

Research in one vital area in the elementary and secondary school facility is the need for automating the school library to the greatest possible extent. Encompassing, as it does, the small elementary school with a very limited library to the large senior high school, which in many cases has a substantial library, the possibilities are limitless. It is technologically feasible to issue to each student a library card with a pre-determined credit for use in either a small or a large automated library. This card, inserted in the vender, would record all pertinent data and automatically deliver to the student the book desired. Such books -- upon their return to the library -- would be automatically recorded on the student's library card, and any penalties or fines would be deducted from the credit card balance. These techniques will be developed during the 1960's, relieving the teaching staff or voluntary help of the many manual details involved in operating libraries in the elementary and secondary schools.

Married students' housing areas are already being serviced in many colleges by automatic laundries and dry cleaning plants. Twenty-four-hour, completely automatic grocerettes, combined with automated snack bars as restaurants to provide most of the supermarket shopping conveniences in the housing area itself, will make their appearance before 1965. Personal and classroom supplies will be offered throughout the campus, in student centers, academic buildings, dormitories and recreation areas. This is the future of vending application to college food and convenience problems.

SECTION IV

SUMMARY

The future holds the certainty of more and more demands for all kinds of consumer personal services with the maximum of convenience and availability. The dramatic growth of automatic merchandising -- vending -- has been directly proportionate to these increased demands.

It is predictable that, within the decade of the 1960's, relatively few "away from home" meals will be prepared the same day they are served. Quality meal components or complete meals will be prepared days, weeks or even months ahead, stored, electronically and automatically served piping hot, warm or chilled as required. Hours of service will cease to be a limiting factor in what can be offered, where it can be offered, or how it can be offered. Storage and preparation space requirements will be reduced sharply. Total labor costs also will be reduced sharply at the same time that better qualified and trained personnel will be demanded.

The school administrator -- whether his concern be for a one-unit elementary school, a large district, or a university campus -- has a common problem: how best to utilize available facilities to execute the best possible total educational program. Automating the housekeeping services can relieve him of many of the drudgery details always associated with these responsibilities. The attendant savings can make a major contribution to the total budget.

Immediately following World War II all college campus's were swamped with returning G.I.'s. Manually operated facilities of all kinds were taxed beyond their capacity. Many administrators felt that this was a temporary situation which would "return to normal" after the G.I.'s completed their education and moved on into the business world.

This has not, of course, been the case. The boom in the demand for a college education has not slackened since the end of World War II. One of the marked changes of recent years has been the increasing percentage of married students attending college. By 1960 the married student population at many colleges had reached substantial numbers in terms of the total registration. This trend gives every indication of continuing during the decade of the 1960's.

The need for married students housing, with all of the service facilities needed for what in effect has become a residential community on campus, poses problems for the college administrator never before experienced. Probably the first automation came about through the installation of automatic laundries in these areas. But in the early 1960's many of these were supplemented by automatic dry cleaning plants. Space and building requirements at most colleges have limited the ability to provide other community services such as supermarkets, variety stores and all of the many services required by a community of families. The need and demand for these services can only be met through the greatest possible degree of automation.

It is predictable with sincerity that 24-hour completely automatic grocerettes combined with automatic snack bars will, by the middle of the 1960's, provide most of the supermarket shopping conveniences in the housing area. Included will be venders capable of dispensing automatically a wide range of variety products including, but not limited to, cosmetics, small household supplies and appliances, hardware items and some clothing items. These compact shopping areas can be provided with a minimum capital expenditure for facilities and equipment. They will be engineered into an original building designed for newly-married student housing so that these complexes will be complete living and service areas.

To the extent required, personal and class room supplies will be offered throughout the campus including student centers, academic buildings, dormitories and recreation areas.

The decade of the 1960's will see research in the field of automating the college library to the greatest possible extent. This will involve the concept of a student library card having a pre-determined credit established, and accounting automatically accomplished through electronic devices. That portion of the library that is most commonly used for references will be automated both in the withdrawal and return of books. Every possible application of vending must be fully explored by the college administrator in eliminating the many bottle-necks experienced in handling the tremendous volume of books, pamphlets and research publication from the stacks to the student. This is a tremendous challenge to the imagination of the college administrator and the vending engineer.

The application of the vending techniques to the physical storage and movement of any product, food, beverage, supplies or books, is inevitable when these techniques will relieve the human hand of details and leave him free for more productive application of his time. This is the real challenge and benefit of vending. The college student of today will be the administrator of the push-button world of tomorrow. His imagination in the years to come, with the experience and training he receives in college, will depend on the future technological developments in all areas of our economy. One of the most challenging is vending.

TABLE I

POPULARITY RATING OF VENDED ITEMS (MOST POPULAR ITEM LISTED FIRST)*

Entrees

Roast Turkey with Dressing
Braised Swiss Steak
Roast Beef
Braised Minute Steak
Roast Leg of Veal
Breaded Veal Cutlet
Braised Veal Steak
Stuffed Pork Chop
Breaded Pork Cutlet
Roast Loin of Pork
Fried Shrimp
Baked Ham
Grilled Ham Steak
Corned Beef Brisket
Liver & Onions

Entrees

Chili
Beef Pot Pie
Sirloin Tips
Chicken Pot Pie
Salisbury Steak
Diced Turkey
Chopped Hamburger
Stuffed Pepper
American Goulash
Goulash & Noodles
Meat Loaf
Salmon Loaf
Catfish
Chop Suey
Fillet of Perch
Shrimp Creole
Ham, Tomato & Cheese

Entrees

Chili Mac
Meatballs & Spaghetti
Swedish Meat Balls
Franks & Beans
Baked Hash
Chicken Croquettes
Macaroni & Sausage
Baked Tuna & Noodles
Franks & German Potato Salad
Macaroni Au Gratin
Polish Sausage
Spaghetti & Tomato Sauce
Ham Creole
Fish Cakes
Corn Fritters
Fish Sticks
German Potato Pancakes

Hot Sandwiches

Barbecued Beef
Cheeseburger
Steak
Ham Steak
Barbecued Turkey
Ham & Cheese
Barbecued Ham
Barbecued Pork
Corned Beef
Polish Sausage

Hot Sandwiches

Chili Frank
Grilled Cheese
Frank & Cheese
Frank with Bacon
Fish Cake
Scrambled Egg
Meat Loaf
Grilled Bologna
Western Sausage Patty

Cold Sandwiches

Turkey & Bacon
Barbecued Turkey
Roast Beef
Ham & Cheese
Club Sandwich
Corned Beef & Swiss Cheese
Barbecued Ham
Ham, Salami & Cheese
Corned Beef
Ham
Pork
Braunschweiger & Bacon
Bacon & Swiss Cheese
Bacon, Lettuce & Tomato

Cold Sandwiches

Beef Spread
Tuna Salad
Chicken Salad
Beef Salad
Ham Salad
Salmon Salad
Egg Salad
Meat Loaf
American Cheese
Swiss Cheese
Bologna
Salami
Liverwurst
Lettuce & Tomato

*Based on a six-month analysis of a completely automatic food operation in the Midwest. Popularity will vary considerably with region and location.

POPULAR VENDED VEGETABLES & SALADS

Vegetables

Asparagus
Baked Beans
Blue Lake Green Beans
Ford Hook Lima Beans
Buttered Beets
Harvard Beets
Broccoli
Buttered Cabbage
Sliced Carrots
Carrots and Peas
Whole Kernel Corn
Egg Plant
Buttered Hominy
Mixed Vegetables
Green Peas
Escalloped Potatoes
Au Gratin Potatoes
Hash Brown Potatoes
Oven Brown Potatoes
Parsley Potatoes
Sweet Potatoes
Whipped Potatoes
French Fried Potatoes
Hot Potato Salad
Sauerkraut
Buttered Spinach
Buttered Succotash
Stewed Tomatoes
Broiled Tomatoes

Salads

Beets, Pickled
Cole Slaw
Combination Salad
Cottage Cheese
Cucumbers, Sliced
Egg, Sliced Boiled
Fresh Fruit Salad
Jello
Potato Salad
Tomatoes, Sliced
Waldorf Salad
Kidney Bean Salad
Stuffed Celery
Fruit Jello
Mexican Slaw
Jellied Country Salad
Sunshine Salad
Jellied Waldorf Salad
Spring Salad
Cole Slaw Souffle
New Manhattan Salad
Macaroni Salad
Jellied Bouillon
Quick Jellied Consomme
Heart of Lettuce Salad

Salad Plate

Sliced Roast Beef, Potato Salad
Tomato Stuffed with Beef Salad
Tomato Stuffed with Ham Salad
Chef Salad, Julienne Ham & Cheese
Summer Cold Plate
Tuna Fish Salad Plate
Chicken Salad Plate
Tomato Stuffed with Chicken Salad
Tomato Stuffed with Tuna Salad
Norwegian Sardines, Potato Salad
Tomato Stuffed with Salmon Salad
Seafood Salad Plate
Chef Salad with Shrimp
Jello, Cottage Cheese and Fruit Salad
Dutch Salad
Fruit Plate
Chef Salad, Julienne Cheese
Picnic Salad
Tomato Stuffed with Egg Salad
Cottage Cheese and Assorted Fruit

Fruit

Applesauce
Fresh Apple
Fresh Fruit
Fruit Cocktail
Peach Half
Pear Half

Above have been and are being vended successfully at a completely automatic cafeteria in the Midwest.

Figure 1. School Lunch Program

A DRAMATIC DEPARTURE from the customary manual serving methods ordinarily found in the school lunch program was made in Oakland, Calif., at the start of the 1961-62 school term, for the first time anywhere, Type "A" school lunches were served automatically in three elementary schools. The food is pre-packaged for dispensing through the automatic venders which are set on "free-vend" and do not require coins to operate them. A typical lunch sells for 30 cents which is collected in advance by school lunch workers. The experiment is being conducted at John Swett, Laurel and Burckhalter schools in Oakland.

Figure 2. Ease of Selection

SELECTIVE VENDERS offer a variety of nourishing foods for grade school students. This model offers pushbutton selection of milk or fresh fruit.

Figure 3. Student Union Vending Installation

AN AUTOMATIC MEAL AND REFRESHMENT INSTALLATION is located in the new student union at the University of Kansas City.